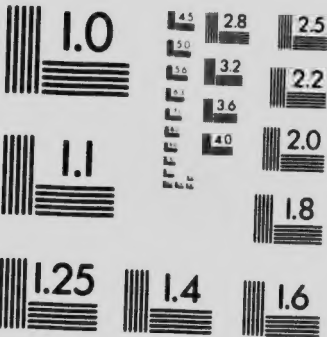


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ON NEW SPECIES OF ASPIDERETES FROM
THE BELLY RIVER FORMATION OF
ALBERTA, WITH FURTHER INFORMATION
REGARDING THE STRUCTURE OF THE
CARAPACE OF BOREMYS PULCHRA

BY

L. M. LAMBE

OTTAWA

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*On new species of Aspideretes from the Belly River formation of Alberta,
with further information regarding the structure of the carapace
of Boremys pulchra.**

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(Read May 26, 1914.)

A well preserved carapace of a turtle, belonging to the genus *Aspideretes*, family *Trionychidae*, forms part of the Geological Survey collection of vertebrates of 1913 from the Belly River formation on Red Deer river, Alberta. All the bones which formed the shell are intact and the sutures are very distinctly marked. The species is apparently undescribed, and for it the name *subquadratus* is proposed.

The carapace is somewhat quadrangular, and broader than long. In front and behind the outline is concave, laterally it is flattened, and becomes broadly angular on each side of the anterior and posterior emarginations.

The matrix, a sandy clay, has not yet been removed from the lower surface of the shell so that the present description will be confined to the upper exposed part only.

As the specimen now is, and it does not appear to be abnormally flattened, or crushed, it is transversely convex with a sudden deflection of the lateral border most pronounced at the middle of the sides. In a longitudinal direction the shell is nearly flat with a slight inclination upward in advance of the first neural bone; the front and back margins are acutely rounded. The maximum elevation of the shell above the lowest part of the lateral downturned edge is about 29 mm. The length of the carapace at the mid-line is 201 mm., and the greatest breadth 225 mm.

In the mid-line are seven neural bones, preceded by a short preneural. The costal bones number eight.

The preneural is four-sided, broader than long, and broadest in front. The first four neurals are six-sided, longer than broad, with two postero-lateral short sides, at the front end of which the bone is broadest. The preneural and the first and second neurals have about the same breadth. The second neural is the longest. The fifth and sixth are slightly irregular in shape, and longer than broad.

*Communicated by permission of the Director of the Geological Survey.

The fifth is broadest behind with one postero-lateral short side, the sixth is broadest in front where there is a short antero-lateral side. The seventh neural is irregularly shield-shaped, with the pointed end behind. The sizes of these bones are given in mm. in the accompanying table:—

<i>Bone.</i>	<i>Length.</i>	<i>Breadth.</i>
Preneural	13	19
Neural 1.	22	19
Neural 2.	27	18
Neural 3.	25	17
Neural 4.	25	15
Neural 5.	20	11
Neural 6.	18	10
Neural 7.	13	10

Of the costal bones the first is the broadest (fore and aft) at mid-length. The second, third, fourth, and fifth have about the same breadth at mid-length, the second and fifth attaining a greater breadth distally than the other two. The eighth pair meet along the mid-line for a distance of 19 mm., and have a posterior free border which is considerably longer than their breadth (fore and aft). The seventh pair of costals meet at the mid-line behind the seventh neural. The preneural and the anterior two-thirds of the first neural lie between the first pair of costals.

The sculpture of the carapace of this species consists of a shallowly pitted surface in the neurals and at the inner end of the costals. Passing outward on the costals the pits become larger, and lengthened in a fore and aft direction by coalescence. Toward the distal end of the bones the coalescence becomes more pronounced and results in tortuous grooves of varying length, transverse to the length of the bone. The grooves are separated by narrow, frequently inosculating, sinuous ridges whose breadth is much less than the width of the enclosed sunken areas.

The presence of the preneural bone, in combination with its other structural characters, clearly indicates the generic relationship of this specimen. In no described species of the genus *Aspideretes* is there the same assemblage of characters as is found in the outline of the carapace, the size, shape and proportions of the seven neural bones, the nuchal bone, and the posterior costals of this specimen.

In some forms of *Amyda* the sculpture of the carapace closely resembles that of certain species of *Aspideretes*. Generally the

sculpture in these closely allied genera does not afford sufficiently reliable data for a specific determination when the material is fragmentary.

The above carapace, the type of *Aspideretes subquadratus*, was found by George F. Sternberg of the vertebrate palaeontological collecting party of 1913.

In 1902* the writer described an almost complete carapace of a turtle from the Belly River formation on Red Deer river in Alberta, and referred it to Leidy's species *Trionyx foreatus* from the vicinity of Judith river, Montana, U.S.A. In making this determination the writer was influenced by the sculpture of the proximal half of the costal bone which with other shell fragments, constitute the type material of Leidy's species. It is probable that this *Trionyx* (*Aspideretes* of Hay) from the Belly River formation of Alberta is distinct from Leidy's species which is not determinable generically. For this turtle, therefore, from the Belly River formation the new specific name *maturus* is proposed to distinguish it from the form from the vicinity of Judith river, Montana. The name *maturus* is intended to convey not only the idea of an early appearance in Cretaceous time but also an attainment of general structural characters maintained by the Trionychidae with little change through later forms to existing species. *Aspideretes maturus* differs from *A. subquadratus* principally in the shape of the carapace, the number, form and proportions of the neural bones, and the shape and proportionate size of the posterior costals.

One of the principal distinguishing characters of the Belly River Cretaceous Amphichelydian genus *Boremys* of the family Baenidae is the presence in the carapace of supramarginal scutes. In common with other genera of Baenidae inframarginals occur in the plastron.

Boremys pulchra† was described by the writer from material which he collected in 1898 and 1901 in the Belly River formation on Red Deer river, Alberta. In the type specimen the plastron was complete but the hinder half of the carapace was missing. Another specimen, consisting of the carapace only, supplied valuable information regarding the number, shape and disposition of the horny scutes but in it most of the sutures between the bones could not be traced.

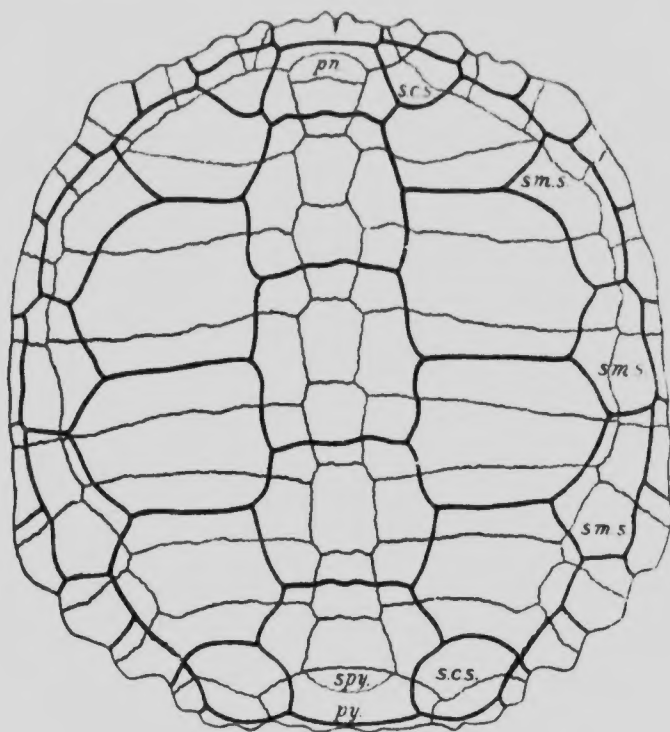
*Geol. Survey, Canada, Summary Report for 1901; Contributions to Canadian Palaeontology, Vol. III (quarto), Part II.

†Contributions to Canadian Palaeontology, Vol. III (quarto), Pt. II, p. 43, fig. 8, 1902; Ottawa Naturalist, Vol. XIX, No. 10, January, and No. 12, March, 1906.

Included in the collection of 1913, from the Belly River formation at the type locality, is a complete shell of this species in which the structure and form, in both plastron and carapace, are well preserved, supplying the deficiencies of the material hitherto available. This interesting specimen was discovered by L. Sternberg of the collecting party of last summer, and corresponds almost exactly in size with the type.

The following general description of the carapace of this species, with more particular reference to its hinder half is now given.

The carapace is nearly as broad as long, and is broadest in its hinder half. The margin in front is sinuous and rather flatly curved; postero-laterally it is scalloped, and narrowing rather rapidly backward, is flattened behind. The upper surface is moderately arched.



CARAPACE OF *BOREMYS PULCHRA*, LAMBE.

One-half the natural size.

S.C.S., supernumerary costal scute; *S.M.S.*, supramarginal scute; *pn.*, preneural bone; *py.*, pygal bone; *spy.*, suprapygial bone.

The peripheral edge is sharply rounded where free, becoming thinner and more acute where it is scalloped; at the bridges there is a decided angulation.

The shell is sculptured in a conspicuous manner by a combination of nodes and ridges. In the longitudinal mid-line there is a ridge along the length of the neural bones. In the more anterior neurals this ridge may become double with minor oblique ridges and grooves on each side. Slightly behind the centre of each of the four larger costal scute areas there is a node, or swelling, from which radiate well-marked ridges which tend to become nodular or elevated where they terminate. Other minor swellings occur along the front peripheral margin, and near the margin laterally and posteriorly. This sculpture pattern is definite and gives an undulatory surface to the carapace.

The carapace is composed of the following bones:—in the mid-line, the nuchal, a preneural, eight neurals, a suprapygol, and pygal; on each side, eight costals; on the periphery, twelve marginals to each side. The horny shields or scutes, as indicated by the grooves, or sulci, were as follows:—in the central line, the nuchal scute and five vertebrales; to each side, four large costal scutes with a small supernumerary costal in front, and a small posterior one, making twelve costals in all; eleven marginal scutes on each side, and between the larger costals and the marginals three supramarginals of fair size.

The nuchal bone is three times as broad as long, and is excavated behind for the reception of the anterior edge of the preneural. This latter is half as broad as the nuchal, and short from front to back. The first neural is four sided and broadest in front. The second, third, fourth and fifth neurals have six sides of which the two antero-lateral ones are short; their greatest breadth is far forward at the back termination of the short sides. The sixth neural is eight-sided with four short sides of which two are antero-lateral and two postero-lateral. The seventh neural is six-sided with two postero-lateral short sides. The eighth neural is four-sided and broadest behind. The suprapygol is lenticular in outline, of the same breadth as the eighth neural, and three times as broad as long. The pygal is more than three times as broad as long, and twice the breadth of the suprapygol which is received into an emargination of the front border of the former bone.

Of the eight costal bones the first is irregularly triangular, the second, third, fourth, sixth and seventh increase in breadth (fore and aft) distally, the fifth narrows to its distal end, and the eighth is of irregular shape.

The marginal bones are mostly subquadrangular in shape; there is little difference in their length but they vary considerably

in breadth according to their position on the periphery. In the front half of the carapace they are longer than broad with the exception of the first which is triangular and very small. The eighth, ninth and tenth are broader than long; in the eleventh and twelfth the reverse is the case.

The reader is referred to the accompanying figure for a general idea of the shape of the carapace as well as for the relative size and disposition of the bones and scutes.

Of the vertebral scutes the first is nearly twice as broad as long, in the second the length and breadth are about equal, in the third the length slightly exceeds the breadth, and the fourth and fifth are broader than long. Their transverse sulci cross the first, third, fifth and seventh neural bones. The breadth of the nuchal scute is about four times its length.

The four larger costal scutes are all broader than long notwithstanding the intervention of the three supramarginals between them and the marginals. The presence of additional costal scutes, one in advance of the first costal, the other behind the fourth, lessens the length principally of the first and fourth scutes. The anterior supernumerary costal is somewhat triangular in shape, the posterior one is irregularly oval, or sub-circular.

The three supramarginal scutes are long in comparison with their breadth, and are in a row, alternating with the costal scutes, between them and the marginals.

The marginal scutes are all longer than broad. Those which bound the supramarginals outwardly are noticeably reduced in breadth, the largest being the third and the ninth, in advance of the first supramarginal and posterior to the third respectively. The inner sulcus of the tenth marginal scute overlies, or corresponds in direction with, the suture between the eleventh marginal and eighth costal bones.

The space occupied by the supramarginal scutes seems to have affected the breadth of the marginal scutes to a greater extent than it has that of the vertebral and costal scutes. The presence of supramarginals probably accounts to some extent for the breadth of the carapace in comparison with its length.

The carapace of *Boremys pulchra* is remarkable for the presence in it, on each side, of three supramarginal scutes, and two supernumerary costal scutes. The suprapygal bone between the eighth neural and the pygal repeats posteriorly what is found anteriorly, viz., the intervention of the preneural between the first neural and the nuchal. In front there is the separation of the preneural from the first neural, and posteriorly the suprapygal from the eighth neural. Attention is again directed to the sculpture of the carapace.

PLATE

Carapace of *Aspideretes subquadratus*; type; one-half the natural size. Belly River formation of Alberta.



